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## PATENT SPECIFICATION



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### PROVISIONAL SPECIFICATION

#### Improvements in and relating to Colour Lighting Apparatus

We, HOLOPHANE LIMITED, a British company, of Holophane House, Elverton Street, London, S.W.1, and ROLLO GILLESPIE WILLIAMS, a British subject, of 16, Cumberland Drive, Esher, Surrey, do hereby declare the nature of this invention to be as follows:—

This invention relates to electric colour lighting apparatus, in particular colour lighting troughing used for example for cornice lighting. In general this comprises a trough to contain the lamps, placed close to the ceiling so that the lamps themselves are screened from view and the lighting is indirect. The usual arrangement for colour lighting consists of light sources of a sequence of colours, say three primary colours, in repeated order, the ultimate light effect being a mixture of the several colours. Each colour group can have dimmer control when any desired mixture can be obtained. The coloured sources may comprise either coloured (colour sprayed) lamps or uncoloured lamps with colour screens. The former give very even, well diffused and well mixed illumination but are inefficient; the latter while efficient give local strongly lit areas wherein the colour of the source predominates. The object of the invention is to improve the diffusion and mixing while using colour screens efficiently. To this end the lamps which are set with their axes parallel are each provided with a relatively long screen wrapped about the axis of the lamp and the section of the screens and spacing of the lamps is such that the screens do not substantially interfere with the radiation from adjacent lamps. (It will be understood that a screen of one colour is substantially opaque to rays filtered by a screen of another colour). Since in general the downward radiation of the lamps is caught and partially reflected upwards by the trough, the screens can be more or less semi-circular in section; the usual screen material is thin and flexible and can readily be bent to form. By making the screens comparatively long in relation to the lamps their ends can be left open without losing control over a substantial angle in any plane containing

the lamp axis; a convenient proportion with a screen fairly closely wrapped round the lamp is to make the length of the screen beyond the lamp filament twice the length from the socket to the filament. This open end much facilitates ventilation which is essential if the screen is to have a reasonable life. The wall of the trough itself may shield the open ends of the screens.

In one preferred construction the trough comprises a flat bottom which is made reflective on its upper surface as by glossy white paint, a pair of closely spaced flat rear walls, the front of which carries the lamp sockets and the rear of which encloses a wiring box which may be closed at the top by a hinged lid, a flat front wall apertured for ventilation spaced a little forward of the ends of the colour screens, and another flat wall spaced in from the front wall to trap the light which would otherwise pass through the ventilation apertures. This trap wall is raised from the bottom of the trough to permit the air to flow round it and further ventilation holes are provided in the bottom of the trough which stands on low feet to enable air to enter from below. The screens themselves are of substantially semicircular form and their edges slip into grooves formed by flanges on the bottom of the trough. They are preferably of light diffusing character. Using 60 watt lamps of standard size set horizontally at right angles to the length of the trough, the lamps may be spaced at 6 inch centres, the screens may be  $2\frac{3}{4}$  inches in radius set to bring their summits  $3\frac{3}{4}$  inches above the bottom of the trough, and their lengths may be  $10\frac{1}{2}$  inches, the filaments of the lamps coming  $3\frac{3}{4}$  inches from the wall carrying the lamp sockets.

It will be understood that instead of setting the lamp axes at right angles to the length of the trough they may be inclined. Further the screens instead of being portions of a cylinder can taper from the socket end to the other end thus reducing the size of the open end. Finally it is possible to mould the screens with the end remote from the socket closed, but ventilation is then difficult.

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Dated this 1st day of March, 1938.

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285, High Holborn, London, W.C.1,  
Agents for the Applicants.

# COMPLETE SPECIFICATION

## Improvements in and relating to Colour Lighting Apparatus

We, HOLOPHANE LIMITED, a British company, of Holophane House, Elverton Street, London, S.W.1; and ROLLO GILLESPIE WILLIAMS, a British subject, of 16, Cumberland Drive, Esher, Surrey, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to electric colour lighting apparatus, in particular colour lighting troughing used for example for cornice lighting. In general this comprises a trough to contain the lamps, placed close to the ceiling so that the lamps themselves are screened from view and the lighting is indirect. The usual arrangement for colour lighting consists of light sources of a sequence of colours, say three primary colours, in repeated order, the ultimate light effect being a mixture of the several colours. Each colour group can have dimmer control when any desired mixture can be obtained. The coloured sources may comprise either coloured (colour sprayed) lamps or uncoloured lamps with colour screens. The former give very even, well diffused and well mixed illumination but are inefficient; the latter while efficient give local strongly lit areas wherein the colour of the source predominates.

The present invention employs screens and its object is to improve the diffusion and mixing while using the screens efficiently. To this end the lamps which are set with their axes parallel are each provided with a screen of substantially greater length than the lamp, so bent about the axis of the lamp as to intercept substantially the whole emission both direct and reflected of the lamp and the section of the screens and spacing of the lamps is such that the screens do not substantially interfere with the radiation from adjacent lamps (it will be understood that a screen of one colour is substantially opaque to rays filtered by a screen of another colour).

Since in general the downward radiation of the lamps is caught and partially reflected upwards by the trough, the screens can be more or less semi-circular in section; the usual screen material is

thin and flexible and can readily be bent to form. By making the screens substantially longer than the lamps their ends can be left open without losing control over a substantial angle in any plane containing the lamp axis; a convenient proportion with a screen fairly closely wrapped round the lamp is to make the screen start at the plane of the socket and make the length of the screen beyond the lamp filament twice the length from the socket to the filament. This open-end much facilitates ventilation which is essential if the screen is to have a reasonable life. The wall of the trough itself may shield the open ends of the screens.

A construction embodying the invention is shown by way of example in the accompanying drawing in which

Figure 1 is a perspective view of one length of the trough,

Figures 2 and 3 are sections through one screen and adjacent parts, respectively taken longitudinally and transversely of the trough.

Referring now to the drawings, the trough comprises a flat base 1 which is made reflective on its upper surface as by glossy white paint, a pair of closely spaced flat rear walls 23, the front 2 of which carries the lamp sockets 4 and the rear 3 of which encloses a wiring box which may be closed at the top by a hinged lid 5 in this example in two separate lengths, a flat front wall 6 apertured at 7 for ventilation spaced a little forward of the ends of the colour screens 8, and short flat walls 9 spaced in from the front wall 6 to trap the light which would otherwise pass through the ventilation apertures 7. These trap walls 9 are raised from the bottom of the trough to permit the air to flow round them and further ventilation holes 10 are provided in the base of the trough which may stand on low feet or be otherwise supported to enable air to enter from below.

As shown the screens themselves are of substantially semicircular form and are conveniently held in thin sheet metal border frames 11, the longitudinal edges of which slip into grooves formed by flanges 13 on the base 1 of the trough. At their ends the frames 11 rest on substantially semicircular flanges 14, 15 on the walls 2, 6 respectively and are secured

thereto as by screws 16. The walls 9 are made short enough to come wholly within the flanges 15. The structure of the screens may be stiffened by longitudinal wires 17. The screens themselves are preferably of light diffusing character. Using 60 or 75 watt lamps of standard size set horizontally at right angles to the length of the trough, the lamps may be spaced at 6 inch centres, the rest of the proportions being substantially as indicated in the drawings. The same sizes can even be made to serve for 100 watt lamps. It will be apparent from Figure 2 that in view of the shape of the screens and the slight spaces left between adjacent screens, a very wide angled fan shaped spread of light is obtained through any one screen up to the limits where it is cut off by adjacent screens; it will also be apparent from Figure 3 that in this plane also a wide spread of light is obtained up to the limit at which the walls of the trough cut it off. In use the lamp socket end will be placed nearer the wall since in this plane the spread it cut off at a higher angle than at the other end.

The example shown in Figure 1 is a length of troughing containing six lamps. Such is a suitable size with lamps of the power usual in apparatus of this type, but it will be understood that any other number might be employed. In use any number of lengths of troughing may be abutted end to end and mounted in any convenient manner.

It will be understood that the lamp axes need not be set at right angles to the length of the trough as indicated in Figure 1; they may for example be inclined. Further the screens instead of being portions of a cylinder can taper from the socket end to the other end, thus reducing the size of the open end. Finally it is possible to mould the screens with the end remote from the socket closed, but ventilation is then difficult.

Having now particularly described and

ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Electric colour lighting apparatus in which the lamps are set with their axes parallel and each is provided with a screen of substantially greater length than the lamp so bent about the axis of the lamp as to intercept substantially the whole emission both direct and reflected of the lamp, the sections of the screens and the spacing of the lamps being such that the screens do not substantially interfere with the radiation from adjacent lamps.

2. Electric colour lighting apparatus according to claim 1 in which the screens are of substantially semi-circular section, the diameter being closed by the base of the apparatus.

3. Electric colour lighting apparatus according to claim 2 in which the screens are open at the end remote from the lamp sockets and extend further in this direction from the lamp filaments than towards the lamp sockets, the open end being shielded by an opaque wall.

4. Electric colour lighting apparatus according to claim 3 in which ventilation openings are provided in the base and in the shielding wall, light being prevented from passing through the latter openings by trap walls spaced inwards from said wall.

5. Electric colour lighting apparatus according to any preceding claim comprising a trough in which the lamps are set perpendicularly to the length of the trough.

6. The electric colour lighting apparatus above described and shown in the accompanying drawings.

Dated this 1st day of March, 1939.

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& STEPHENS,

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285, High Holborn, London, W.C.1.  
Agents for the Applicants.

[This Drawing is a reproduction of the Original on a reduced scale.]

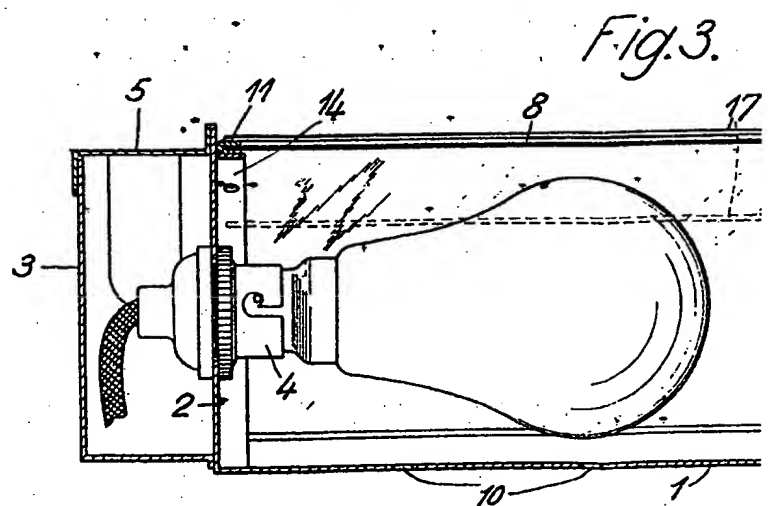
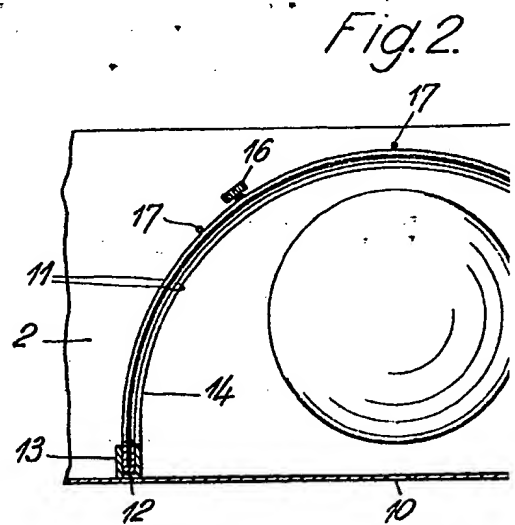
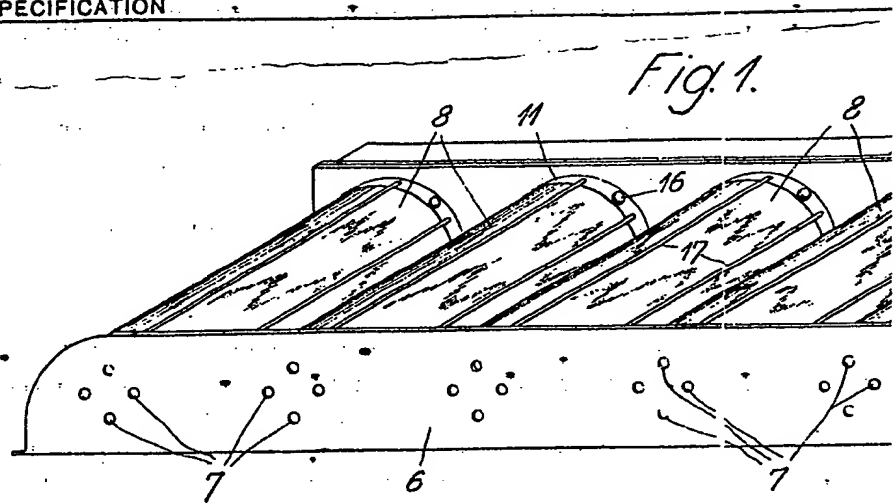


Fig. 1.

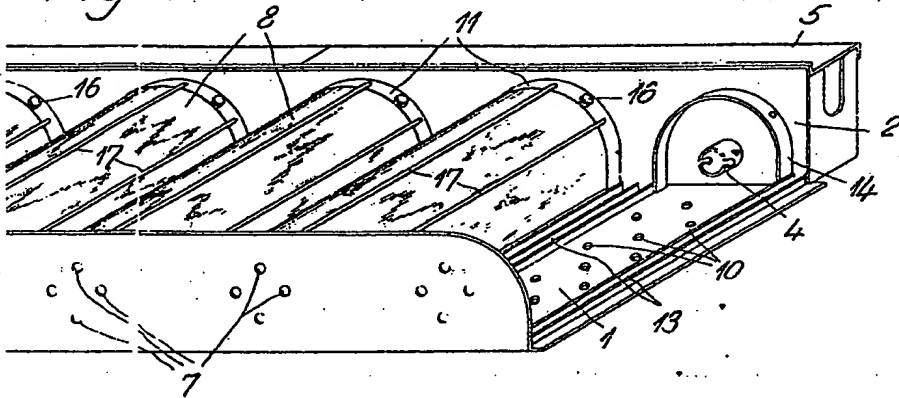


Fig. 2.

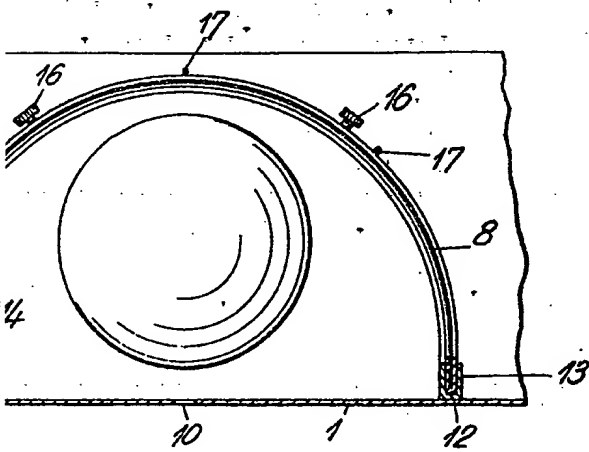
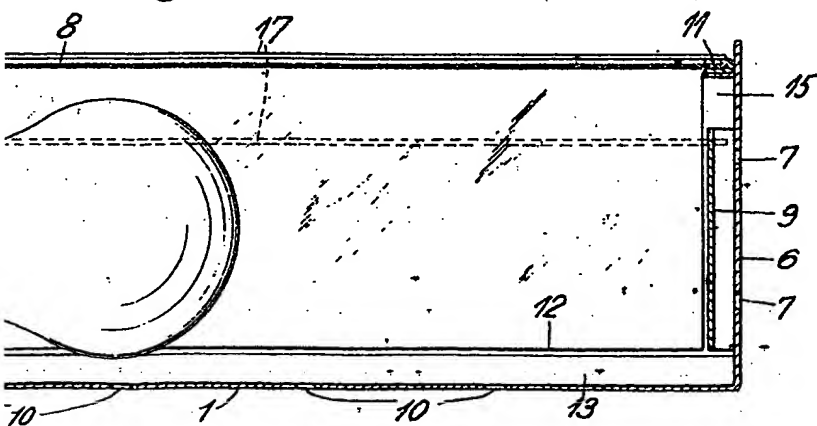


Fig. 3.



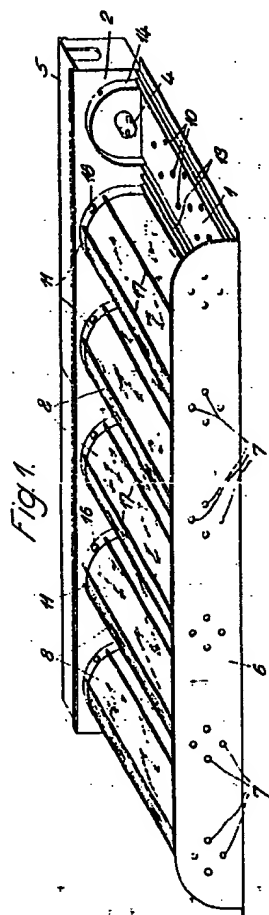


Fig. 1

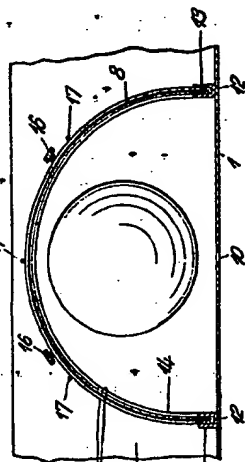


Fig. 2



Fig. 3

[This Drawing is a reproduction of the Original on a reduced scale.]